

with the other fine arts, and to a sketch of its history, which is less satisfactory than other portions of the work. The following account of Hebrew music is quaint in the extreme:—"David and Solomon were very musical. They composed psalms full of inspiration, and evidently intended to be sung. To the latter is due the magnificent organisation of the singing in the Temple at Jerusalem. He founded a school for singers, and a considerable band, which at last reached the number of 4,000 trumpeters." The "Lyre of Orpheus," and the ratios derived from its traditional four strings, are far more fully explained. The Ambrosian and Gregorian scales follow, as well as the first attempts at polyphonic music in the tenth and eleventh centuries. Guy d'Arezzo is still credited with the invention of modern notation, though he really only used "neumas" and two clef lines, or staves, one yellow and one red. Luther, who doubtless was a musician, is accepted as the reformer of music as well as of the church. The modern and Pythagorean scales are numerically compared, and then transposition and modulation lead to a description of temperament. "The temperate scale," as it is here termed, "starts with the principle of making no distinction between the major and minor tone, of confounding the major semitone with the minor, and of considering the sharp of a note as equal to the flat of the succeeding note; so that all the notes of an octave are reduced to twelve only, which are considered equidistant from each other."

The difficulties in the way of true intonation, especially in the case of keyed instruments, are fairly stated, and the writer concludes with a remark in which we cordially sympathise:—"It does not, therefore, appear impossible, or even really difficult, for the full orchestra and chorus to perform a piece of music in the exact scale."

The subject of the eighth chapter is quality or "Timbre," in which Helmholtz's views are expounded and illustrated by good diagrams of optical and graphical methods, and of Koenig's ingenious apparatus. The last section draws distinctions between music as a science and as an art, and between Italian and German music; giving a remarkably fair estimate of Rossini's position as a melodist, rather than as a scientific musician, and on the other hand a deserved tribute of praise to the lofty character and deep dramatic feeling which, "notwithstanding some too realistic exaggerations, and some trivialities," mark the compositions of Richard Wagner.

On the whole, this volume is easily and clearly written, although, as already noted, it is rather sketchy and hurried in the historical part. There are other minor typographical, or probably translator's, oversights, such as Terpandro for Terpander, Cornue for Cornu, Orlando Tasso for Orlando Lasso, and harmonicon for harmonium. But it affords a readable *résumé* of a subject which is daily rising in scientific, as well as in purely artistic interest.

W. H. STONE

TWO BOOKS ON LANGUAGE

The Existence of Mixed Languages. By J. C. Clough. (London: Longmans, Green, and Co., 1870.)
On the Comparative Method of Learning Foreign Languages. By L. J. V. Gerard. (Leicester: 1876.)

THE existence of mixed languages is one of the vexed questions of Comparative Philology. By a mixed language is meant a language in which the grammars of

two or more different languages have been fused together, not one in which the vocabulary is of a heterogeneous character. Mixed languages in the latter sense are, of course, plentiful enough; in fact there are languages like the Basque or the Telugu, in which the proportion of borrowed words is larger than that of native words. But though words may be borrowed, it is a grave question whether the expression of grammatical relations can be, and modern philology has been inclined to deny the possibility of such an occurrence. The grammar of one speech may be influenced by that of another, existing machinery being adapted to express grammatical conceptions introduced from abroad, or foreign modes of forming the sentence being imitated, and the idioms of one language may even be adopted by another, but anything beyond this is extremely unlikely. It is in grammar and structure that languages differ from one another; the expression of the relations of grammar embodies the mode in which a particular community thinks, and a change in their expression is equivalent to a change in the mode of thinking. And this mode of thinking is the result of a long succession of past experiences and stereotyped habits of thought.

Mr. Clough boldly challenges the orthodox view of the impossibility of mixed languages. He endeavours to support his heresy by an appeal to contrary instances. Thus he points to jargons like the Chinook, or Pigeon-English, to languages like Maltese or Hindustani, which have grown out of jargons, and finally to independent forms of speech like Turkish or Persian, in which he believes he finds examples of mixed languages. But he does not always distinguish between mixture in the grammar and in the vocabulary, or between the borrowing of idioms and of grammatical conceptions. Hence a large part of his book, that which deals with languages like the Keltic, the Romanic, and the Teutonic, is quite beside the point. On the other hand, he has omitted to notice some very important cases of an apparently mixed grammar, such as the Pahlavi of ancient Persia, the Assamese and kindred dialects of Northern India, and the Sub-Semitic languages of Africa. A full discussion of the phenomena presented by these might lead to a modification of the orthodox doctrine, at all events so far as the flexion of the noun is concerned. As it is, Mr. Clough has brought forward a good deal of pertinent matter, though a larger amount of what has nothing to do with the question in dispute. The whole of the second part of his "book, for example, which relates to English, might easily have been spared. The book, however, is full of information, and the facts collected are usually accurate.

M. Gerard has reprinted a lecture delivered by him at the Leicester Museum, on the scientific, and therefore the natural, way of learning foreign languages. The lecture is an excellent one, at once original, clear, and practical. M. Gerard is no friend to existing systems of teaching French and German, and he is undoubtedly right in his belief that their failure is due to a neglect of the way in which children learn their own or a foreign tongue. Instead of beginning by studying the rules of grammar and loading the memory with lists of isolated words, the child speaks in sentences, and only gradually learns to distinguish the several words of a sentence and the parts of

speech to which they belong. To learn to speak a foreign language by reading a grammar and writing exercises is an impossibility. We must imitate the procedure of the child, and be content to follow the same method in learning a new language that we followed when learning our own. The essence of a language is its idioms; no amount of grammatical study will teach us these. The study of grammar should come after our acquisition of a language, not before it.

M. Gerard defines his method as follows:—"We must accustom ourselves to the expression of ideas in the language we wish to learn by comparing it with their expression in our own, until we are able, through imitation and analogy, to express them in our own. In other words, we must understand the language and think in it before we use it." Understanding a language means reading and hearing it; using a language means speaking and writing it. Hence the course of study recommended by M. Gerard comprises the four distinct processes of reading, hearing, speaking, and writing, reading coming first and writing last. If reading is the primary object in learning a new language, M. Gerard's course is undoubtedly the right one, but if speaking is rather aimed at, we think it a mistake to make reading precede. What is heard will then have to be translated into the language of the eye before it is understood, and this will be a serious impediment to the learner. Moreover, a language consists in the phonetic sounds by which it is conveyed, not in the symbols whereby these sounds are expressed on paper. Learning to read should follow learning to speak, as it does in the case of children. With this single exception, we can heartily endorse all M. Gerard's recommendations; they are founded upon nature and reason, and their practical efficiency has already been proved. Especially noticeable are his remarks on the use of translations; a dictionary is desirable only when we have acquired a fair elementary knowledge of a language and its forms of expression. Language starts with the sentence, not with the isolated word.

A. H. SAYCE

OUR BOOK SHELF

The School Manual of Geology. By J. Beete Jukes, M.A., F.R.S., late Director of the Geological Survey of Ireland. Third Edition, revised and enlarged, edited by A. J. Jukes-Browne, B.A., F.G.S. (Edinburgh: A. and C. Black, 1876.)

THE late Prof. Jukes's admirable "School Manual of Geology" is already so favourably known to teachers of the science, for the clearness of its style, the accuracy of its information, and the abundance and excellence of its illustrations, that, in welcoming the appearance of a third edition of the work, we shall confine ourselves to a few remarks upon the changes which the editor has found necessary to make in it. In doing so, we have again to commend Mr. Jukes-Browne's skill in so well maintaining the distinctive characters of his uncle's work, while not hesitating to introduce such new matter as is demanded by the progress of the science.

In revising the chapter on igneous rocks, the editor acknowledges the assistance he has received from the Rev. T. G. Bonney. The principle of classification which he adopts—that, namely, of grouping the rocks, not according to one set of characters only, but on the basis both of their mineralogical constitution and their minute structure—we consider unexceptionable. To some of the definitions adopted in this chapter we must however de-

mur, as for example to those of andesite, porphyrite, and diorite, in all of which the essential felspar is stated to be *oligoclase*. As petrographers are not in possession of any ready means for determining the exact variety of felspar in a rock, in the absence of a complete chemical analysis of it, such a distinction becomes almost entirely useless in practice. Most continental writers avoid this difficulty by applying the same general terms to all such rocks as are shown, by microscopic examination or otherwise, to have any variety of the plagioclase felspars as their predominant constituent. We must also confess to grave doubts as to whether the revival of the obsolete term *leucilite* is warranted either by necessity or convenience.

In respect to that long-vaed question of geology, the limit between the Silurian and Cambrian systems, we think that Mr. Jukes-Browne has exercised a very wise discretion. He has in the present edition adopted the judicious compromise between the claims of Murchison and Sedgwick, which was long ago suggested by Lyell and Phillips, and has received such able support from the researches of Salter and Hicks. If convenience and scientific truth are not to be wholly sacrificed to the desire to do homage to the memory of an individual, it is quite time that the aggrandised empire of Siluria should be resolved into its proper elements, and that these should resume their due place in the brotherhood of formations.

In introducing some necessary changes into the chapter on the Glacial period, the editor has wisely avoided too hastily adopting any of the crude speculations which have recently been advanced on the subject. The statement, however, that the till of Scotland is of *older* date than the boulder clay of the English Midland Counties surely stands in need of some modification.

We heartily congratulate the editor and publishers of this very useful little manual on the well-merited success which it has attained.

Geology: its Influence on Modern Beliefs. Being a Popular Sketch of its Scientific Teachings and Economic Bearings. By David Page, LL.D., F.G.S. (Edinburgh and London: William Blackwood and Sons, 1876.)

UNDER the above title Dr. Page has published two essays which are devoted to an exposition of the chief scientific results, and a vindication of the economic value and importance, of geological research. The somewhat rhetorical style of these essays is sufficiently accounted for by the fact that they were originally prepared by their author as popular lectures for an Edinburgh audience—a disposition of them which was frustrated by his ill-health. Dr. Page has very effectively grouped, and eloquently sustained his several theses, while many of the chief points of his discourses are rendered more telling by admirably chosen illustrations from the immediate neighbourhood of the city in which the lectures were to have been delivered. In one or two instances, however, we notice that the author has not succeeded in avoiding the danger of making his generalisations of too sweeping a character—as for example when he informs us, without any qualification, that "men need not search for the veined marbles of the metamorphic rocks in tertiary beds, for metalliferous veins in secondary strata, nor for workable coal-seams in the Old Red Sandstone and Silurian systems."

The Law of Storms Considered Practically. By W. H. Rosser. (London: Chas. Wilson, 1876.)

We have read this little book with very great pleasure, and can strongly recommend it to the navigator as giving briefly, but pleasantly and intelligently, an account of the history of the law of storms, down to the present time, inclusive of the various theories which have been propounded. The book is also to be commended as evincing throughout a remarkable justness of criticism, of which